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AJ84M

COOPERATIVE FARM BUILDING

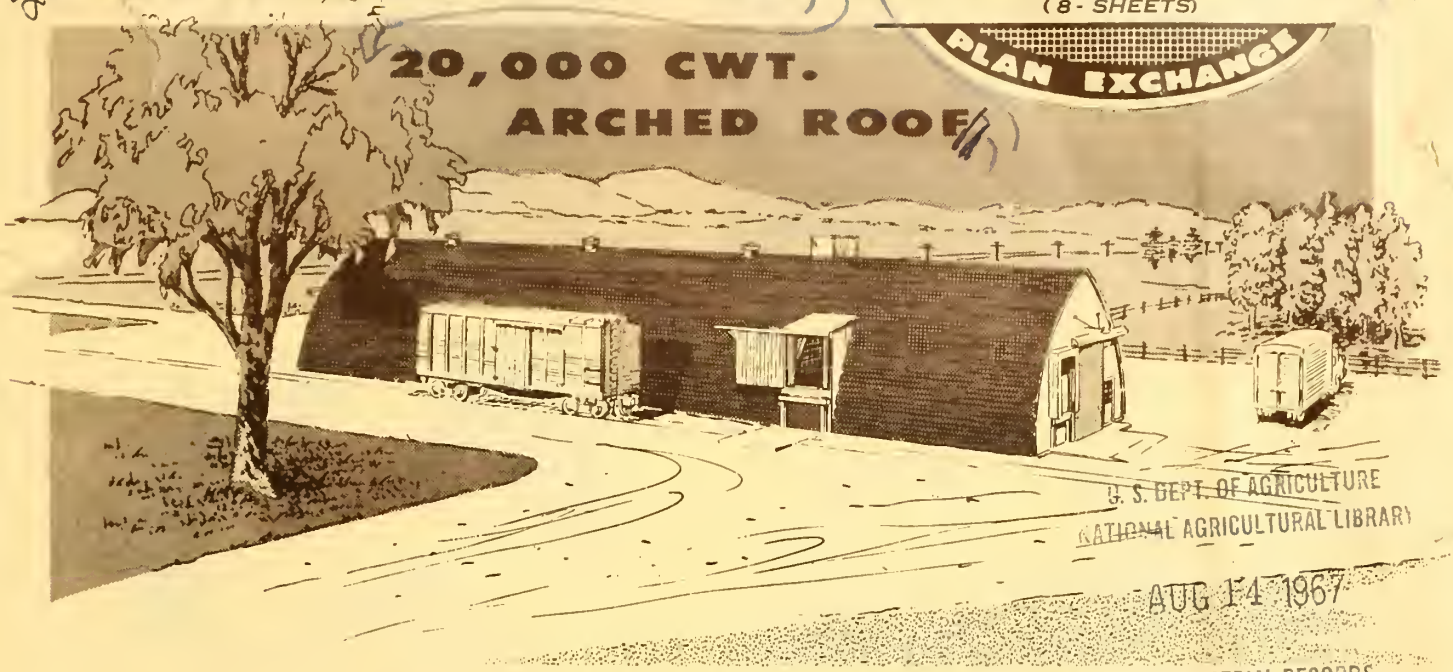
Plan No. 5989

(8-SHEETS)

PLAN EXCHANGE

POTATO STORAGE

20,000 CWT. ARCHED ROOF



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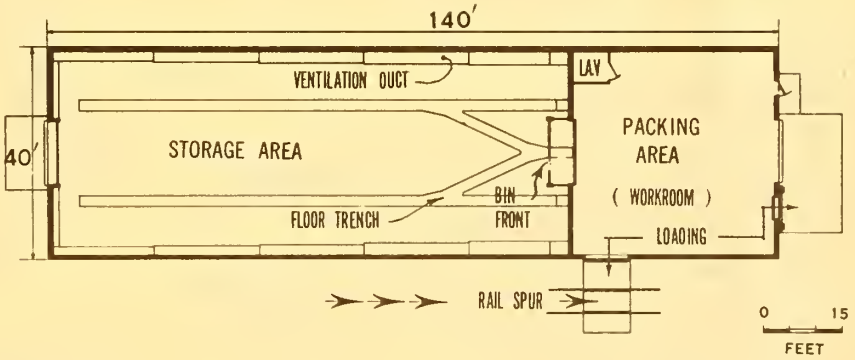
CURRENT SERIAL RECORDS

This design is for storing and packing of seed, processing, and table stock potatoes in the fall crop areas of the United States. The plant consists of a single storage bin of 20,000 cwt. capacity and 1,600 square feet of work area. The overall floor area totals 5,600 square feet. The work area may be used for grading, sorting, packing, seed cutting, and shipping.



The storage is arched rafter, wood-frame construction on a concrete slab-on-grade floor. The arched rafters are spaced 24 inches on center and are sheathed on the outside with either 1-inch dressed pine or ½-inch exterior grade plywood. The sheathing is then covered with lock-down, double coverage, asphalt shingles. The storage is insulated with glass fiber batt insulation. To prevent moisture migration into the insulation from the high humidity environment within the building, a 6-mil polyethylene vapor barrier is attached to the inside surface of the storage. The interior sheathing can be either corrugated galvanized metal or exterior grade plywood.

During cold weather, the storage and the work area are heated by separate gas-fired furnaces.

A complete set of working drawings and specifications may be obtained through your county agricultural agent or from the extension agricultural engineer at most State agricultural colleges. There is usually a small charge.

If you do not know the location of your State university, send your request to Agricultural Engineer, Federal Extension Service, U.S. Department of Agriculture, Washington, D.C. 20250. He will forward your request to the correct university.

ORDER PLAN NO. 5989, POTATO STORAGE
20,000 Cwt. Arched Roof

Washington, D.C. June 1967

UNITED STATES DEPARTMENT OF AGRICULTURE Miscellaneous Publication No. 1057

For sale by the Superintendent of Documents, U.S. Government Printing Office
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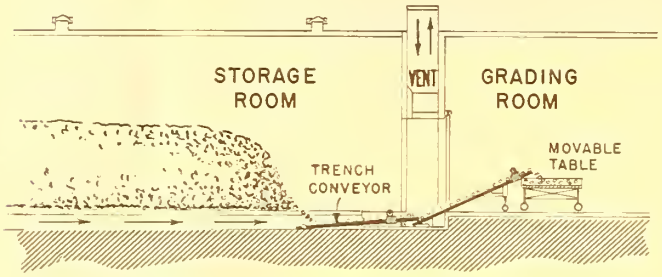
storing & handling

Bulk potatoes are received from the field in hopper-bottom or flat-bottom farm trucks. A bin piler is used for moving the potatoes from the trucks and placing them in the storage. A door is provided at the end of the storage for easy access during the filling operation. The storage bin is unloaded either by a conveyor in the floor trenches or by small, powered loaders with bulk scoops. When a conveyor is used, the potatoes either slide on it or are forked onto it. The conveyor is connected to a movable grading table on which the potatoes are graded and sorted. When the bulk loader is used, the potatoes are moved in quantities of about 700 pounds to a stationary grading table located in the work area.



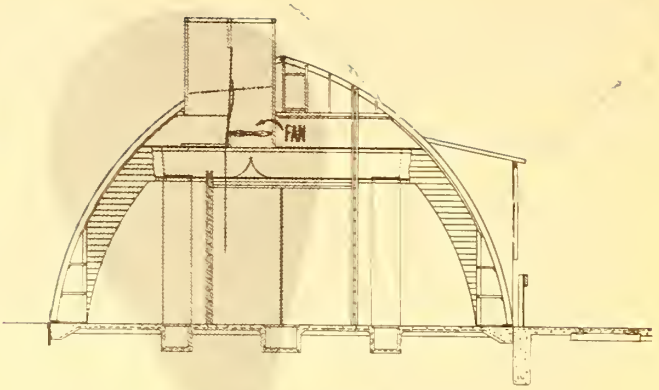
MOVING POTATOES BY CONVEYOR

ventilation

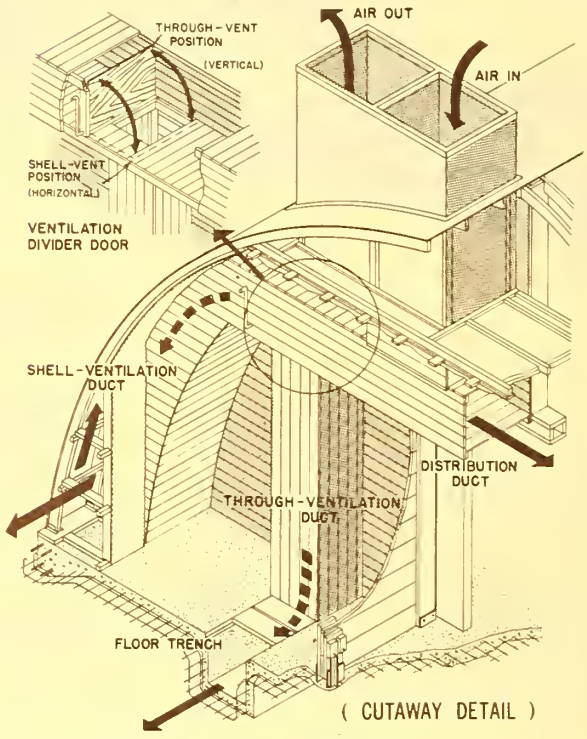
The ventilation system has an axial flow propeller fan capable of delivering air at the rate of 15,500 c.f.m. at ½ inch of water static pressure. The fan is driven by a 2-hp., 3-phase, 230-volt, AC motor.

The storage operator manually controls the air to the ventilation system. However, the system is protected from receiving excessively cold air by a low-temperature-limit thermostat which turns on a warning system and shuts off the ventilation fan.

Generally, seed and table stock potatoes require only shell ventilation during storage. Processing potatoes require through ventilation or a combination of shell and through ventilation. The ventilation system is versatile in that either shell ventilation or through ventilation or a combination of the two may be used. Shell ventilation in this design is accomplished by passing air through large equal friction supply ducts at the lower perimeter of the outside walls. The air then passes up the arched rafter space and end wall stud space and is discharged into the space above the potato pile where it returns to the fan end of the bin. With shell ventilation, potato pile temperature is controlled by heat transfer through the wall and by the wiping action of the ventilation air as it moves over the pile on its return to the fan end. By placing the ventilation divider doors in a vertical position, through ventilation is achieved and circulating air is passed upward through the potato pile from the floor trenches. During this process, heat is conducted from the potatoes to the air being forced through the pile. The air is then forced to the top of the pile where it moves to the end of the bin where the fan is located. In all cases, the air moves to the fan end of the bin where it is either exhausted or recirculated, depending on the desired storage environment.



CROSS SECTION



(CUTAWAY DETAIL)

AIR MOVEMENT AT FAN END OF STORAGE BIN

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CURRENT SERIAL RECORDS

These plans developed by:

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TRANSPORTATION AND FACILITIES RESEARCH DIVISION
AGRICULTURAL RESEARCH SERVICE

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